An

# Inaugural Essay.

Passed

on the

## Modus Operandi of External Irritants.

Submitted to the Faculty of Medicine

of the

University of Pennsylvania

for the degree of M. D.

by

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How warmly soever, it may be desired, and how-
-soever ardently it may be sought for - perfection in any partic
-ular art or science, is indeed but seldom to be attained. The mind
of man, eager in the pursuit of knowledge, enlarges & expands
in proportion to the ardour with which it grasps and improves
the various means of gratifying its thirst for information, which
fortuitous circumstances or the peculiar exertions of the inde=
-vidual may have placed within his reach - But altho' the
mind be thus constantly progressing & constantly be=
-coming more & more enriched with the treasures of
Science, it never here, can arrive at that point beyond
which no field is presented for the active exercise of
its powers - There are many of the arts & sciences, however,
which have added to the comfort & happiness of domes=
-tic & civil life, which, if not carried to their utmost limit,
are stamped at least with certainty, as far as they have
progress'd - Each step which has been taken is based on
truth - each supports the other, and the mind can follow

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on with pleasure, for it meets with no extravagant, unproved theory to perplex - Unfortunately such is not, such cannot be the case with all - Still there is among some a greater jarring - a greater discordance of principles, than we might naturally expect - And, when we consider the bearing which the science of Medicine, has upon the comforts of life; how much the aggregate of happiness depends upon the right understanding of its principles, and the proper management of its remedial means - we are induced, before we become acquainted with the actual state of the science, most cordially to hope that it has, if not perfection, at least, a great degree of certainty & unanimity of sentiment among those who profess to be its votaries - and when we remember the genius - the skill & learning, which have rallied under its banners - we are naturally led to the conclusion that such must be the case

A contemplation of the history of medical science, its rise and progress - would be calculated to induce us to suppose, that surely no malady now exists, which had not its antidote among the host of remedies which have from time to time, & continually, been introduced as ornaments

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of the materia medica - he would be prepared to ask, what disease is there, to which humanity is heir, still remaining as an "opprobrium medicorum"? What disease, against the ravages of which man has not presented an effectual barrier? Surely we know of none whose terrors were not, at some period, to yield to the remedial efforts of some enthusiast - Those diseases which had baffled the caution of the most learned & experienced of the profession - which refused to yield to the united efforts of skill intelligence & extensive observation, and which had for ages remained as sad memorials of the still imperfect condition of medical resource, were to bow submissively before the happy discovery of some previously unknown remedy - Its specific virtues have been announced to the world & future fame & a lasting reputation, warmly & unhesitatingly anticipated, by the self-deemed fortunate discoverer. Fortunate, indeed, would it be for him, & fortunate for the world were it found that frequently one half of his statements would stand the touchstone of experience, and, that time, the genuine test of excellence, would sanction the decision - Sometimes like the "baseless fabric of a vision" it goes no

further than the deluded judgment of the promulgator - It is met with caution - tested - found inefficient & forgotten - At other times, there are not wanting those, who, apparently yielding the privilege of examining & reasoning for themselves - willingly and unhesitatingly enlist under the banners of error, and thus tend, tho' perhaps, unwittingly, to promote the cause of delusion & misrepresentation. Were these individuals beyond the pale of medicine or confined to the lower walls of the profession, the evil would be comparatively slight; but when we see men whose abilities have ranked them among the ornaments of the science, & whose countenance & support always predispose us to receive as certain, whatever may have the sanction of their belief; when we see such, notwithstanding the evidences of error easily to be perceived, giving their aid to uphold the offspring of fable, misrepresentation or delusion - we cannot condemn the scepticism which in all ages many have evinced respecting the efficacy of medicinal agents - But a short time since and Hydrophobia was to yield its gigantic terrors to what a little experience proved to be "an herb possessing no power of any kind - producing no effect more than a decoction

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of paper or straw, being absurdly call'd a medicine and prescribed as a remedy for a malady always disastrous & generally fatal" (Barton) – The Scutellaria Lateriflora will always carry with it the conviction that judgment may indeed be sometimes wrefully deceived, & genius made the instrument for the promulgation of error – Phthisis Pulmonalis still baffles the exertions of skill & experience – but numerous are the ~~statements of those who prepared them~~ medicines, which, from the statements of those who proposed them, were to shield its victims from the mournful result which now so generally attends it –

This has been the case with numerous articles, and has not been confined to those, which, upon mature and deliberate investigation, have been found destitute of every remedial property; but the discrepancy of opinion has existed with respect to many, which are characterised by powerful action; and, indeed what article is there, amid the vast catalogue of remedies, which crowd the list of the materia medica, the use of which is sanctioned by general approbation? What particular disease is there, in the treatment of which, there does not exist great

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disparity of sentiment respecting the utility of almost every proposed remedy? A reference to the history of the Mat: med: will shew us a host of articles, which have possessed an ephemeral existence which have sprung into notice gifted with all the excellence that deluded enthusiasm could bestow, have lived their hour, disappeared & become unknown - a the names of which, only remain to point out how great dupes we may be made to misguided judgment -

The student has many difficulties to encounter - Induced by a hope of having it in his power ~~of~~ to alleviate in some degree the sufferings of humanity - he engages in the study of his benevolent & interesting profession - Fired by a holy emulation to excel, he commences and pursues his path, perhaps with enthusiastic ardour - The alluring and pleasing nature of his application leads him smilingly onward & in a moment of zealous emulation, he deems nothing short of perfection can satisfy him - But soon his ardour receives a check, for he makes but little progress, before he finds himself bewildered and perplexed amid the clashing of too many a discordant sound - He finds himself in a labyrinth - with

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many ways to proceed - but now, as far as he is able to judge, it leads him safely through - He meets with an assertion contradictory of one, he has found laid down by some author previously read - He reflects upon the mooted point - but can come to no satisfactory conclusion - Both rank high in their profession and both should be believed - but which must? Recourse to a third author, will, frequently, but add to his perplexity; both opinions he may now find condemn'd, a new one advanced. Willing to believe that such discrepency of opinion, can but rarely occur, he leaves the subject - tho' unsatisfied - But ere long a similar difficulty arises - an other - and an other, & indeed he finds himself surrounded by contrariety of sentiment, each one right, if his own assertion be received, neither, if that of his brother practitioner be consider'd - What then is he to do? Become the submissive votary of one great name? This would be to yield his reason captive; he feels that instead of enlarging his views & thinking for himself, he must by so doing bind his every thought to the chariot wheels of another & go just when he may please direct - He had determined perhaps to be the ~~slave~~ slave to none - "Nullius juraw in verba magistri" -

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to listen to all, but to claim the privilege of forming his own conclusions! And, thus, amid his perplexity, what can he do? but shut his books or go on uncertain of his way - wrapt in a continued cloud of obscurity & doubt - his ardour cooled, his zealous emulation damped?

"A discordance", says Dr Jackson, "in the results of experience exists, where authority is equal & fact opposes fact, with such equal weight of testimony, as renders a decision extremely embarassing - on some of the most important facts, both theoretical & practical - all that has heretofore been written has left the question wholly undecided, & there still prevails a wide diversity of sentiment respecting them"

Though, as we have stated, short-lived indeed has been the glory of many a boasted remedy - there still remain those whose virtues have stood the test of ages of experience, & whose value must ever be appreciated, tho' the time may be, perhaps, still far distant (notwithstanding the warmth with which its arrival may be anticipated) when a perfect unanimity of sentiment will exist among medical men, respecting their proper exhibition -

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It was much to be wished, that someone, whose talents & extensive observation, may have equal'd to the task - would forcibly exhibit the causes of this wide discrepency, and point out the means whereby it may be obviated (for to the evil certainly remedies may be applied) - and thus each practitioner might guard against the rocks on which many have struck, & the progress of the science would be stamped with a greater degree of regularity, & it would advance with more hasty, tho' not less certain strides towards perfection -

External Irritants (the subject on which I purpose making a few remarks in the present dissertation have, perhaps, met with few totally & unreservedly to condemn them - but the best mode of application - the circumstances under which they should be resorted to, & the mode in which they produce their effect - have given rise to eager controversy & many disquisitions - But in this case, as in many others, the calm dispassionate practitioner, anxious to promote the best interest of his profession, pursues his course unmoved & uninfluenced by the -

surrounding contents. It is not my intention in the present essay to enter into an elaborate discussion - to point out those indications which particularly require the application of this class of remedies - but to offer a few remarks respecting their - modus operandi

The manner, in which an epispastic produces a blister, is sufficiently intelligible & well known. By the irritation of the Cantharides, the vessels of the cutis are stimulated to more vigorous action, inflammation is excited - effusion is the consequence, & the impervious cuticle not permitting the exhaled fluid to escape, a vesicle or blister is formed. Altho' this immediate effect of the application is sufficiently explicable - the precise mode in which they relieve disease, is a point much disputed - It was once supposed, that the acrid particles were absorbed into the system, & in this manner, was explained their remedial efficacy - This hypothesis now, however, claims but few advocates, and it is unnecessary to dwell upon it

It was, also, formerly thought, that the benefit chiefly arose from the evacuation - That this, is sometimes productive of good - no one will, perhaps, pretend to dispute - but on this principle

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solely, in every case to account for their salutary tendency - is to decide before reflecting & observing - for the fact that the desired relief is sometimes obtained before effusion takes place - shews the fallacy of the theory - As also the disproportion between the relief obtained, & the quantity of fluid evacuated - militates against the supposition - There are, perhaps, but few cases where any evidently most great advantage is derived from the mere evacuation - Some cases of cellular Dropsy evince it.

Altho' benefit thus may occasionally arise from the primary effusion - we also sometimes obtain it from the secondary discharge say - that of pus - The advantages of a drain of this kind, we frequently see exemplified in the effects of issues &c in various diseases of the lungs, liver - joints &c as also in the cases of purulent discharges from behind the ears of children, which, when suddenly suppress'd are followed by consequences of a serious nature - which are obviated only by a renewal of the discharge - It may, perhaps, be made a question whether the benefit is actually to be attributed to the discharge - we should be inclined to think not; but rather to the derivation from other parts to that, where the discharge takes place - As one will

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suppose, that by the process - morbific matter is eliminated from the system - ~~Subdued~~ Disease action is subdued - but it is by subtracting, if I may use the expression, the fuel which feed the flame -

It has lately been observed, that but little advantage is derived from their application - unless they be "somewhat painful" and that it is the irritation, rather than the discharge, which constitute the cause of their utility - That they should be necessarily attended with pain to produce their effect, appears controverted by experience - Do we not frequently witness the benefit of a blister, where the patient, at the time is sensible of no pain in the part? And, not merely so, but do we not sometimes see the apparently anodyne effect of the application? Do we not see the salutary tendency of an issue, unless pain be a necessary attendant on it? That irritation may be requisite seems explicable, for without some irritating cause, the discharge would not perhaps be kept up - The irritation we can readily conceive to exist, without the system being conscious of such, as far as arises from the sense of pain - The irritation is necessary, in as much as it keeps up a determination to the part, & the discharge is a symptom or evidence of that irritation.

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May we not suppose that in cases of acute inflammatory action, more benefit would arise, & probably the chief benefit does arise, from a painful external application, than we should derive from an open issue unaccompanied with pain? But, in cases of chronic inflammation particularly, may we not suppose benefit to arise independently of any sensible irritation? Does not daily experience verify the supposition? Within a succession of painful irritants - would not, under these circumstances - more effectually, perhaps more speedily accomplish the object, may admit of question, but, that the gradual operation of the former remedy is productive of no utility, cannot be allowed -

Banfield in an essay on Curvitures &c of the Spine in the London Medical & Physical Journal, relates a case of the a disease of the hip joint, when the patient "was assail'd by the eruption from of variola, followed by a very numerous crop of pustules all over the body - During the period of S. Pox, the discharge from the abscess around the hip joint rapidly diminished, and ~~at the~~ in 3 weeks from the termination of Small Pox ~~they~~ had quite healed and ceased to discharge" "In this case", he proceeds to say, "it would seem, as if the eruption of Small Pox acted as it

ment by Metastasis in transferring the secretion of pus from around the hip-joint to the skin - or the salutary mode of operation may be by counter-irritation "We will not say that the discharge is invariably to receive the credit for the obtained relief - Nor do we think it generally to be the case, on the contrary, circumstances appear to warrant the conclusion, that we are most frequently to attribute the benefit to other causes which will be hereafter mentioned. Still, that we should follow the example of some late writers, and condemn this as production of no good, would be perhaps to make too bold a stroke.

The efficacy of these applications, Cullen thinks arises from their relieving spasm - This antispasmodic virtue is certainly frequently apparent - but, it arises perhaps from an indirect effect - After the application of a blister we may find the skin which was previously hot and dry, to become moist & relaxed, & the salutary effect of the application, may appear dependant on its relaxing power -; but some local internal pain - inflammation - or congestion, may have been the probable cause of this unhealthy condition of the surface, & by the relief afforded to the deep seated part

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able the emunctories are permitted to resume their healthy course of action, and, with the rest, those of the skin. From the relief frequently obtained by the application, in some of the more purely nervous diseases, it has been suggested, "that there may be a balance between the excitement of the internal & external nervous power, as there more evidently is of the circulation" (Parr) and upon this hypothesis would be explained the antispasmodic effect of the remedy.

Altho' we think we have reason to conclude that vesicatories & similar applications, may, in particular cases, be productive of good in the manner above alluded to, still their chief advantage we conceive to be explicable on different principles. The irritation from tartar Emetic applied as an ointment, that from Croton &c, are followed frequently by the most salutary result, & sometimes before any discharge whatever takes place. It has been long observed, that exciting one pain will frequently relieve an other; thus, in a violent paroxysm of tooth ache - a blister behind the ear will often afford effectual ease - We also see the same result from the application in cases of pleurisy - hepatitis - phrenitis - rheumatism & other active -

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inflammation — In these cases we are told "that they excite a new action in the part which by virtue of what Mr Hunter calls con=tiguous Sympathy, relieves that upon which the disease depends" (Paris) — Between many parts of the System there exists a close and intimate Sympathy & the nature of the action going on in one very materially affects the nature of that in the other — And thus by changing the action of a part previously in health but closely sympathizing with one in disease, we may so change the action of the diseased part — as to restore it to a healthy State — And Nature generally attentive to the welfare of the System, would some=times seem to institute a disease in a part, to prevent its attack=ing an other — when death or serious inconvenience might be the Consequence — Thus fistula in ano would sometimes appear to be a substitute for a diseased action of the lungs — May we not naturally come to this Conclusion when we remember that if a cure be effected in a person labouring under this disease, that person will almost invariably become the victim of Pulmonary Consumption?

We are frequently call'd upon to witness and admire the beauty of that sympathy existing between different parts of the body

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What constitutes — or is the medium of this sympathy the most attentive physiologist have not been able to detect — Paris calls it "a mysterious medium"; and thus we must for the present consider it — tho' the effects of its operations are marked & evident — Sir Gilbert Blane defines it "a mutual influence of distant parts, so subtle & rapid as in some instances to be compared to thought or to lightning; in other cases it is an action more tardy and habitual" "The medium of this communication", the same valuable author states, "is probably some imponderable fluid" This principle is perhaps constantly in operation — but in a state of health it may be "so tardy & habitual" as not to attract attention — It is in a state of disease — when its harmony of action is interrupted, that we find its operations strikingly marked To enumerate the various instances of this "mysterious medium", with which we are presented would be unnecessary; It is, however, an interesting subject of reflection — A few remarks may be desirable as introductory to a further explanation of the modus operandi of external irritants — There are few, if any parts of the system which display a more evident and extensive sympathy with other parts, than does the skin

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It is a fruitful source of disease and presents an open field for the diversified & successful application of remedial agents

Sympathy has been divided into - remote - contiguous and Continuous - The first implying that which exists between different parts - without any connection sufficient to account satisfactorilly for its existence - such as the violent pain sometimes felt in the quarter in Gastralgia & pain in the shoulder in inflammation of the liver &c - Contiguous "is that which appears to have no other connection than arises from the contact of separate parts -"
The Continuous - "that where there is no interruption of parts & the sympathy is continued from the imitating point, as from a centre, so as to be gradually lost in the surrounding parts ~~as~~ in proportion to the distance" Burns, however, taking a somewhat different view of the subject divides it into the sympathy of equilibrium & that of association In the first one part is ~~increased~~ weakened by the increased action of an other, & in the second two parts act together at the same time He subdivides the sympathy of association into the interrupted, which would seem to be much the same as the remote of

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of Hunter, and the spreading which would appear to correspond to the Continuous - The sympathy of equilibrium, as Burns understands it, would seem most generally to exist between most distant parts - thus the inflammation & irritation caused in the bladder by the presence of a stone, weakens the powers of the sympathizing stomach - The same is observed in the inflammation of the Kidneys - Thus do we also see when the action of the intestines is increased - a diminished action of the stomach exists & vice versâ - The same may be remarked of the stomach and liver - of the stomach & brain &c. The same holds good with respect to the skin - Hence in various instances of excited action in internal parts - that of the skin is torpid & inactive, And may we not upon this principle explain the benefit arising from the judicious application of external irritants in many cases? By the external irritation the action of the internal inflamed part, whose disease we wish to remove, becomes weakened and the difficulty arising from its inflamed state obviated - operating apparently somewhat upon the principles of revulsion - derivation - or contra determination - Something in the same manner that Bleeding

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acts in Hemoptysis - Altho' it was inexplicable to the mind of Abercrombie, how this remedy could act beneficially in cases of hemorrhage - still the value of it is proved by daily experience - it acting by a diversion of the current of blood from the diseased parts

There are instances however in which external irritation appears to increase the action of sympathizing parts - They are few - but still some exists - In these cases Burns says the action must be suddenly and for a short time increased - An explanation of the beneficial results obtained in some of these cases was suggested by the perusal of several cases related by Dr Cummings in the Edinburgh Medical & Surgical Journal - These were dissections of individuals whose death had been caused by burns and in all which he discovered effusion in the internal Cavities. He says "the occurrence of inflammation and effusion in internal parts - after the surface has been burnt may be regarded as the effort of nature to relieve herself from the consequences of so severe an injury. It may perhaps, furnish an illustration of the mode in which

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internal parts, in a state of inflammation, are relieved by the application of vesicatories to the surface." The superior efficacy of moxa over other external irritants in affording relief in many cases of internal disease has lately been repeatedly noticed - and, may not the advantage obtained in many of these cases be explained on this principle?

Vesicatories are, however, productive of much benefit not only in removing local morbid affections - but have frequently a very pervading effect, & are highly useful in cases of a general or constitutional nature. This is peculiarly exemplified in the result of their application in many low diseases as Typhus &c. Here they appear to evince a stimulating power - The almost dormant powers of the circulation are roused to increased activity - the torpid, languid energies of the system are thus frequently roused from this lethargy of action & greatly restored to a healthy state - The general debility of the system - may, in some instances, be owing to a faulty diseased action of some internal part, & in these cases, the invigoration of the system at large, is caused by subduing the more local morbid action -

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There are some constitutions in which they display a decidedly cordial & exhilerating effect - This, however, is found perhaps in those of a particular constitution; "it is generally found" says Dr Parr "in those of full habit and languid circulation & has arisen from their relieving the over-distended vessels"

The above reflections on the subject of external irritants I have thrown together fully sensible how imperfect they are. I am, notwithstanding induced to present ~~them~~ them to the faculty for their examination - knowing they will make every allowance for what may be the consequence of ~~our~~ want of experience - observation & more extensive reading.

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